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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CHUNDURU, SURYAPRABHA	
ART UNIT	PAPER NUMBER
1637	

DATE MAILED: 07/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/072,666	KUMAR ET AL.	
	Examiner	Art Unit	
	Suryaprabha Chunduru	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 May 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-138* is/are pending in the application.

4a) Of the above claim(s) *137 and 138* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-136* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 February 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicants' response to the office action filed on May 22, 2006 has been entered and acknowledged.

Status of the Application

2. Claims 1-136 are pending. Claims 137-138 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group. Applicants' response to the office action is fully considered. All arguments have been fully considered and thoroughly reviewed, but are deemed persuasive in part for the reasons that follow. This action is made FINAL.

3. The following rejection is made in the previous office action:

Drawings

4. The drawings are objected to under 37 CFR 1.83(a) because they fail to show (label) the panels of Figure 4 (4A, 4B and 4C) as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be

necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

A. Claims 1-11, 23-24, 27-65, 70-75, 79-102, 107-136 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lizardi et al. (USPN. 6,797,474) and in view of Abarzua (USPN. 6,498,023).

With reference to the instant claims 1, 30, 43-49, 107, 124-126, 133-136, Lizardi et al. teach a method for detecting target molecules (analytes) comprising (a) bringing into contact an

target molecule and a reporter binding molecule, wherein reporter binding molecule comprises a specific binding molecule and an amplification target circle, wherein each specific binding molecule interacts with an analyte directly or indirectly, incubating the target and the reporter binding molecule under conditions that promote interaction of the specific binding molecule and analyte (see column 52, lines 62-67, col. 53, line 1-4 (claim 7), also see col. 16, line 23-57); (c) bringing into contact the amplification target circles and one or more rolling circle replication primer(s) (see col. 53, line 5-11), wherein the amplification target circles each comprise a single-stranded, circular DNA molecule comprising a primer complement portion (see col. 9, line 33-48), wherein the primer complement portion is complementary to at least one of the rolling circle primers (see col. 10, line 10-14) and incubating the rolling circle replication primers and amplification target circles and the rolling circle replication primers (see col. 53, line 5-11, col. 21, line 10-36); (d) incubating the rolling circle primers and amplification target circles under conditions that promote replication of the amplification target circles wherein replication of the amplification target circles results in the formation of tandem sequence DNA (TS-DNA) and detection of TS-DNA indicates the presence of the corresponding analyte (see column 53, line 5-12).

With regard to claim 2-3, 6, 8-10, Lizardi et al. teach that the reporter binding molecules further comprise circle capture probe by complementary pairing (see col. 16, line 40-61);

With regard to claim 7, 11, Lizardi et al. teach that said oligonucleotide is blocked (blocked by peptide nucleic acid clamps) (see col. 34, line 35-67, col. 35, line 1-3);

With reference to the instant claims 23-24, Lizardi et al. also teach that the method comprises (i) plurality of reporter binding molecules are brought into contact with the one or

more analyte samples and plurality of analyte samples are brought into contact with the one or more reporter binding molecules (see column 22, line 8-57);

With regard to claims 27-28, Lizardi et al teach at least one of the analytes is from a human source and a non-human source (see col. 36, line 40-49);

With reference to the instant claims 31-61, 63-65, 75, Lizardi et al. teach that the method comprises capture agent (detection probes or antibodies) associated with a solid support and the solid support comprises different reaction chambers or predefined regions the said solid support comprises, glass, or polystyrene (see col. 15, line 1-54, col. 14, line 35-37);

With regard to claim 62, Lizardi et al. teach that said accessory molecule is an analog of at least one analyte (see col. 21, line 45-59, col. 11, line 3-18);

With regard to claim 70-74, Lizardi et al. teach at least one analyte associated with a solid support with one or more chambers (see col. 23, line 9-42);

With regard to claims 79-81, Lizardi et al. teach detection of tandem sequence DNA is accompanied by mixing a set of detection probes under conditions to promote hybridization, wherein plurality of different tandem sequence DNA are detected separately or simultaneously via multiplex detection and detection probes are labeled using combinatorial multicolor coding (see col. 21, line 60-67, col. 22, line 1-7);

With regard to claims 82-85, Lizardi et al. teach that the method further comprises brining into contact a secondary DNA strand displacement primer and the tandem sequence DNA, and incubating under conditions that promote (i) hybridization between the tandem sequence DNA and the secondary DNA strand displacement primer, (ii) replication of the

tandem sequence DNA (see col. col. 12, line 28-67, col. 13, line 1-45, col. 23, line 61-67, col. 24, line 1-67);

With reference to the instant claims 86-102, Lizardi et al. teach that the method comprises detection labels as fluorescent moieties including fluorescent quenchers, which are incorporated into nucleic acids during amplification (see col10, line 45-67, col. 11, line 1-54).

However, Lizardi et al. did not teach decoupling target circles.

Abarzua et al. teach a method for synthesizing multiple copies of single stranded DNA circles of predetermined sequences and with varying sizes capable of ready use in subsequent processes such as rolling circle amplification (see col. 3, line 35-47, wherein Abarzua et al. teach that the method comprises decoupling of amplification target circle facilitated by heat denaturation (see col. 3, line 48-67, col. 4, line 1-15, line 51-67). Abarzua et al. teach that the method allows single-step generation of various sized circles of DNA having unique known sequences that are ideal for multiplexing RCA reactions and detection of multiple targets including DNA, RNA, and proteins simultaneously (see col. 10, line 57-67, col. 11, line 1-25)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method of detecting one or more analytes as taught by Lizardi et al. with a step of decoupling amplification target circle as taught by Abarzua et al, to develop a sensitive method for the detection of multiple analyte(s) because Abarzua et al. explicitly taught the rapid production of a plurality of single-stranded DNA circles (Amplification target circles (ATC)) having predetermined size and nucleotide sequence followed by heat denaturation (decoupling) to yield ready to use single-stranded circles as targets in subsequent rolling circle amplification and detection of multiple target sequences in a single

reaction (see col. 5, line 54-67, col. 6, line 1-8, col. 10, line 57-67, col. 11, line 1-25) and also taught that the method would eliminate the need for cumbersome processes and provide easy and effective means of generating single-stranded circles and the same DNA polymerase would replicate all of the sequences together and their relative abundance in the product would be a function of their relative abundance in the starting mixture (col. 2, line 45-56). Thus an ordinary skill in the art would have a reasonable expectation of success that the modification of the method taught by Lizardi et al. in a manner as taught by Abarzua et al. would work to achieve a sensitive, cost-effective method for generating the target circles for subsequent rolling circle amplification as suggested by Abarzua et al. in detecting one or more analytes and such modification of the method is considered as obvious over cited prior art in the absence of any secondary considerations.

B. Claims 1-136 are rejected under 35 U.S.C. 103(a) as being obvious over Kingsmore et al. (USPN. 6,531,283) and in view of Abarzua (USPN. 6,498,023).

The applied reference has a common Assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in

the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

With reference to the instant claims 1-2, 30, 43-49, 107, 124-126, 133-136, Kingsmore et al. teach a method for detecting one or more analytes comprising (a) bringing into contact one or more analyte samples and one or more reporter binding molecules (reporter primers), wherein each reporter binding molecule comprises a specific binding molecule and an amplification target circle, wherein each specific binding molecule interacts with an analyte directly or indirectly, incubating the analyte samples and the reporter binding molecules under conditions that promote interaction of the specific binding molecules and analytes (see column 41, lines 33-55); (c) bringing into contact the amplification target circles and one or more rolling circle replication primer(s), wherein the amplification target circles each comprise a single-stranded, circular DNA molecule comprising a primer complement portion, wherein the primer complement portion is complementary to at least one of the rolling circle primers and incubating the rolling circle replication primers and amplification target circles and the rolling circle replication primers (see column 41, lines 56-67); (d) incubating the rolling circle primers and amplification target circles under conditions that promote replication of the amplification target circles wherein replication of the amplification target circles results in the formation of presence of the corresponding analytes (see column 42, lines 32-39).

With reference to the instant claims 12-22, Kingsmore et al. teach that the method comprises circle linkers (capture docks), wherein circle linker comprises cleavable bond which

could be a disulfide bond, hetero bifunctional succinimide bond (sulfo-GMBS) maleimide bond, dihydroxy bond or amino linking group (reactive group) which can be cleavable by treatment with a reducing agent (see column 14, lines 25-67, column 15, lines 1-4, column 30, lines 4-10).

With reference to the instant claims 23-29, Kingsmore et al. also teach that the method comprises (i) plurality of reporter binding molecules are brought into contact with the one or more analyte samples (see column 42, lines 40-42); (ii) plurality of analyte samples are brought into contact with the one or more reporter binding molecules (see column 42, lines 43-45); (iii) at least one of the analyte samples comprise a protein or peptide, a lipid, glycolipid or proteoglycan (see column 42, lines 46-49); (iv) at least one of the analytes is from a human source and a non-human source (see column 42, lines 50-53); and none of the analytes are nucleic acids (see column 42, lines 54-55);

With reference to the instant claims 31-32, 35, Kingsmore et al. teach that the method comprises capture agent(s) and analyte(s) associated with a solid support and the solid support comprises different reaction chambers or predefined regions (see column 42, lines 61-67); the said solid support comprises acrylamide, agarose, cellulose, nitrocellulose, glass, polystyrene or polyamino acids (see column 43, lines 29-37);

With reference to the instant claims 36-42, Kingsmore et al. also disclose that the method comprises (i) bringing into contact at least one of the analyte samples with at least one accessory molecule affecting interaction of at least one of the analytes and at least one of the capture agents simultaneously with or following step (a) (see column 43, lines 39-48); (ii) at least one analyte and accessory molecule are associated with the solid support simultaneously with or following step(a) (see column 43, lines 49-55); (iii) the accessory molecule is a protein kinase, a protein

phosphatase, an enzyme or a compound (see column 43, lines 56-58); (iv) interaction of accessory molecule of interest, with one or more analytes are test molecules of interest are detected (see column 43, lines 59-65);

With reference to the instant claims 43-75, Kingsmore et al. also teach that the method comprises (i) one or more first analyte samples and one or more second analyte samples, one or more first reporter binding molecules, one or more second reporter molecules, wherein each different reporter binding molecule is different and each different rolling circle primer primes replication of a different amplification target circle and produces a different tandem sequence DNA (see column 44, lines 9-43); (ii) the tandem sequence DNA corresponding to one of the analyte samples produced in association with an analyte capture agent is in the same location on the solid support as tandem sequence DNA corresponding to the same analyte and produced in association with the matching second analyte capture agent, wherein presence or absence of the same analyte in different analyte samples is indicated by the presence or absence of corresponding tandem sequence DNA (see column 44, lines 53-67, column 45, lines 1-5); (iii) at least one analyte and accessory molecule are associated with the solid support simultaneously with or following step(a) (see column 45, lines 6-55); (iii) the accessory molecule is a protein kinase, a protein phosphatase, an enzyme or a compound (see column 45, lines 36-38); (iv) the accessory molecule is an analog and facilitates interaction of at least one of the analyte capture agents (see column 45, lines 27-35); accessory molecule is at least 20%, 50% , 80%, 90% pure and is associated with solid support (see column 45, lines 39-47);

With reference to the instant claims 76-83, Kingsmore et al. teach that the method comprises modified form of analyte wherein at least one or more analyte capture agents interacts

directly or indirectly with the modified analyte, wherein the modification is post-translational modification, that is phosphorylation or glycosylation (see column 45, lines 55-65); detection of tandem sequence DNA is accompanied by mixing a set of detection probes under conditions to promote hybridization, wherein plurality of different tandem sequence DNAs are detected separately or simultaneously via multiplex detection (see column 45, lines 66-67, column 46, lines 1-7); detection probes are labeled using combinatorial multicolor coding (see column 46, lines 8-9); the method further comprises brining into contact a secondary DNA strand displacement primer and the tandem sequence DNA, and incubating under conditions that promote (i) hybridization between the tandem sequence DNA and the secondary DNA strand displacement primer, (ii) replication of the tandem sequence DNA (see column 46, lines 10-19);

With reference to the instant claims 85-106, 128-132, Kingsmore et al. teach that the method comprises detection labels as fluorescent moieties including fluorescent quenchers, which are incorporated into nucleic acids during amplification (see column 15, lines 55-67, column 16, lines 1-18).

With reference to the instant claims 108-112, Kingsmore et al. further teach that the method comprises (i) treating one or more analyte samples so that one or more samples modified (see column 26, lines 15-48); bringing into contact one or more analytes and one or more arrays wherein each array comprises a set of analyte capture agents, a set of accessory molecules, each interacting directly or indirectly with an analyte, contacting one or more reporter binding molecules under conditions promoting interaction of the specific binding molecules analytes, analyte capture agents and accessory molecules, replicating with rolling circle replication primers to form tandem sequence DNA (see column 26, lines 50-67, column 27, lines 1-23); (ii)

comprises solid support wherein components are immobilized to the solid support at a density exceeding 400 different components per cubic centimeter (see column 21, lines 8-19);

With reference to the instant claims 113-123, Kingsmore et al. also teach that the method comprises (i) analyte capture agents as peptides (see column 13, lines 59-66) immobilized on a solid support comprising 20% to 99% pure capture agents (see column 15, lines 5-20); (ii) comprises peptide, antibodies (antibodies are made up of short peptides) which comprise amino acids of about 20 amino acids (see column 13, lines 59-67, column 14, lines 1-11).

However, Kingsmore et al. did not teach decoupling target circles from the reporter binding molecules.

Abarzua et al. teach a method for synthesizing multiple copies of single stranded DNA circles of predetermined sequences and with varying sizes capable of ready use in subsequent processes such as rolling circle amplification (see col. 3, line 35-47, wherein Abarzua et al. teach that the method comprises decoupling of amplification target circle facilitated by heat denaturation (see col. 3, line 48-67, col. 4, line 1-15, line 51-67). Abarzua et al. teach that the method allows single-step generation of various sized circles of DNA having unique known sequences that are ideal for multiplexing RCA reactions and detection of multiple targets including DNA, RNA, and proteins simultaneously (see col. 10, line 57-67, col. 11, line 1-25)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method of detecting one or more analytes as taught by Kingsmore et al. with a step of decoupling amplification target circle as taught by Abarzua et al, to develop a sensitive method for the detection of multiple analyte(s) because Abarzua et al. explicitly taught the rapid production of a plurality of

single-stranded DNA circles (Amplification target circles (ATC)) having predetermined size and nucleotide sequence followed by heat denaturation (decoupling) to yield ready to use single-stranded circles as targets in subsequent rolling circle amplification and detection of multiple target sequences in a single reaction (see col. 5, line 54-67, col. 6, line 1-8, col. 10, line 57-67, col. 11, line 1-25) and also taught that the method would eliminate the need for cumbersome processes and provide easy and effective means of generating single-stranded circles and the same DNA polymerase would replicate all of the sequences together and their relative abundance in the product would be a function of their relative abundance in the starting mixture (col. 2, line 45-56). Thus an ordinary skill in the art would have a reasonable expectation of success that the modification of the method taught by Kingsmore et al. in a manner as taught by Abarzua et al. would work to achieve a sensitive, cost-effective method for generating the target circles for subsequent rolling circle amplification as suggested by Abarzua et al. for detecting one or more analytes and such modification of the method is considered as obvious over cited prior art in the absence of any secondary considerations.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-136 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-72 of U.S. Patent No. 6, 531, 283 in view of Abarzua et al. (USPN. 6,498,023).

The claims in the patent ('283) disclose and encompasses the instant method wherein the method in the patent comprises (a) bringing into contact one or more analyte samples and one or more reporter binding molecules (reporter primers), wherein each reporter binding molecule comprises a specific binding molecule and an amplification target circle, wherein each specific binding molecule interacts with an analyte directly or indirectly, incubating the analyte samples and the reporter binding molecules under conditions that promote interaction of the specific binding molecules and analytes (see column 41, lines 33-55); (c) bringing into contact the amplification target circles and one or more rolling circle replication primer(s), wherein the amplification target circles each comprise a single-stranded, circular DNA molecule comprising a primer complement portion, wherein the primer complement portion is complementary to at least one of the rolling circle primers and incubating the rolling circle replication primers and amplification target circles and the rolling circle replication primers (see column 41, lines 56-67); (d) incubating the rolling circle primers and amplification target circles under conditions that promote replication of the amplification target circles wherein replication of the amplification target circles results in the formation of presence of the corresponding analytes (see column 42, lines 32-39). However the method in the patent ('283) did not specifically

disclose a decoupling step to dissociate amplification target circle form reporter binding molecule.

Abarzua et al. teach a method for synthesizing multiple copies of single stranded DNA circles of predetermined sequences and with varying sizes capable of ready use in subsequent processes such as rolling circle amplification (see col. 3, line 35-47, wherein Abarzua et al. teach that the method comprises decoupling of amplification target circle facilitated by heat denaturation (see col. 3, line 48-67, col. 4, line 1-15, line 51-67). Abarzua et al. teach that the method allows single-step generation of various sized circles of DNA having unique known sequences that are ideal for multiplexing RCA reactions and detection of multiple targets including DNA, RNA, and proteins simultaneously (see col. 10, line 57-67, col. 11, line 1-25)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method of detecting one or more analytes as taught by Kingsmore et al. with a step of decoupling amplification target circle as taught by Abarzua et al, to develop a sensitive method for the detection of multiple analyte(s) because Abarzua et al. explicitly taught the rapid production of a plurality of single-stranded DNA circles (Amplification target circles (ATC)) having predetermined size and nucleotide sequence followed by heat denaturation (decoupling) to yield ready to use single-stranded circles as targets in subsequent rolling circle amplification and detection of multiple target sequences in a single reaction (see col. 5, line 54-67, col. 6, line 1-8, col. 10, line 57-67, col. 11, line 1-25) and also taught that the method would eliminate the need for cumbersome processes and provide easy and effective means of generating single-stranded circles and the same DNA polymerase would replicate all of the sequences together and their relative abundance in the product would be a

function of their relative abundance in the starting mixture (col. 2, line 45-56). Thus an ordinary skill in the art would have a reasonable expectation of success that the modification of the method taught by Kingsmore et al. in a manner as taught by Abarzua et al. would work to achieve a sensitive, cost-effective method for generating the target circles for subsequent rolling circle amplification as suggested by Abarzua et al. for detecting one or more analytes and such modification of the method is considered as obvious over cited prior art in the absence of any secondary considerations.

Therefore the instant claims are rejected under obviousness-type of double patenting.

Response to arguments:

7. With regard to the objection to the drawings, Applicants did not provide any response or amendment to the drawings, therefore the objection is maintained herein.

8. With regard to the rejection under 35 USC 103(a) over Lizardi et al. in view of Abarzua , Applicants' arguments are fully considered and the arguments directed to the step of decoupling of amplification circles is found unpersuasive. Applicants' argue that Abarzua teaches decoupling of dumbbell shaped DNA circle to open up the circle and brings Examiner's attention to col. 4, line 13-15 and argue that Abarzua does not teach decoupling of an amplification circle from a reporter binding primer. The arguments are fully considered and found unpersuasive because the disclosure of Abarzua et al. teach heat denaturating the dumbbell shaped oligonucleotides to yield single-stranded circular product and the DNA circles as amplification target circles in subsequent rolling circle amplification steps. Thus Abarzua explicitly teach the decopuling (heat denaturing) step. Abarzua et al. also discloses that the reaction includes exonuclease that melts unligated linear oligonucleotides (see col. 15, line 122, col. 16, line 1-16),

that indicate formation of circle DNA and separation of unligated linear oligonucleotides. Thus one skilled in the art would be motivated to combing the teachings of Abarzua to synthesize the circle DNA by decoupling process to enhance the continuous supply of amplification circles as templates for RCA. Therefore the arguments are unpersuasive and the rejection is maintained herein.

9. With regard to the rejection under 35 USC 103(a) over Kingsmore et al. in view of Abarzua , Applicants' arguments are fully considered and the arguments directed to the step of decoupling of amplification circles is found unpersuasive. Applicants' argue that Abarzua teaches decoupling of dumbbell shaped DNA circle to open up the circle and brings Examiner's attention to col. 4, line 13-15 and argue that Abarzua does not teach decoupling of an amplification circle from a reporter binding primer. The arguments are fully considered and found unpersuasive because the disclosure of Abarzua et al. teach heat denaturating the dumbbell shaped oligonucleotides to yield single-stranded circular product and the DNA circles as amplification target circles in subsequent rolling circle amplification steps. Thus Abarzua explicitly teach the decopuling (heat denaturing) step. Abarzua et al. also discloses that the reaction includes exonuclease that melts unligated linear oligonucleotides (see col. 15, line 122, col. 16, line 1-16), that indicate formation of circle DNA and separation of unligated linear oligonucleotides. Thus one skilled in the art would be motivated to combing the teachings of Abarzua to synthesize the circle DNA by decoupling process to enhance the continuous supply of amplification circles as templates for RCA. Therefore the arguments are unpersuasive and the rejection is maintained herein.

10. With regard to the rejection under obviousness-type of double patenting, Applicants arguments are fully considered and found persuasive. Applicants' argue that Abarzua teaches decoupling of dumbbell shaped DNA circle to open up the circle and brings Examiner's attention to col. 4, line 13-15 and argue that Abarzua does not teach decoupling of an amplification circle from a reporter binding primer. The arguments are fully considered and found unpersuasive because the disclosure of Abarzua et al. teach heat denaturating the dumbbell shaped oligonucleotides to yield single-stranded circular product and the DNA circles as amplification target circles in subsequent rolling circle amplification steps. Thus Abarzua explicitly teach the decopuling (heat denaturing) step. Abarzua et al. also discloses that the reaction includes exonuclease that melts unligated linear oligonucleotides (see col. 15, line 122, col. 16, line 1-16), that indicate formation of circle DNA and separation of unligated linear oligonucleotides. Thus one skilled in the art would be motivated to combing the teachings of Abarzua to synthesize the circle DNA by decoupling process to enhance the continuous supply of amplification circles as templates for RCA. Therefore the arguments are unpersuasive and the rejection is maintained herein.

Conclusion

No claims are allowable.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suryaprabha Chunduru whose telephone number is 571-272-0783. The examiner can normally be reached on 8.30A.M. - 4.30P.M , Mon - Friday,.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Prabha Chunduru
SURYAPRABHA CHUNDURU 7/23/06
PATENT EXAMINER

Suryaprabha Chunduru
Primary Examiner
Art Unit 1637